SEQUENCE LISTING

<110> Abbott Laboratories
Mukerji, Pradip

<120> GENES INVOLVED IN POLYKETIDE SYNTHASE
PATHWAYS AND USES THEREOF


<130> 7097USO1

<140> 10/619,532
<141> 2003-07-15

<160> 27

<170> FastSEQ for Windows Version 4.0

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<213> Artificial Sequence

<220>
<223> M13 Forward Primer

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<213> T. aureum

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<213> T. aureum

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<220>
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<211> 24
<212> DNA
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<223> RO 1448 Reverse Primer

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<210> 7
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<212> DNA
<213> T. aureum

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<211> 8748
<212> DNA
<213> T. aureum

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<212> DNA
<213> T. aureum

<400> 9
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<211> 2915
<212> PRT
<213> T. aureum

<400> 10

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Thr Asn Leu Arg Arg Leu Pro Arg Ser Gly Trp Leu Val Ala Leu Gly
        35                  40                  45
Leu Phe Cys Asp Leu Ser Ser Cys Ala Gly Lys Leu Asp Leu Gln Thr
    50                  55                  60
Arg Asp Thr Ala Lys Asp Pro Cys Cys Lys Arg Lys Trp Ser Ala Ser
65                  70                  75                  80
Arg Ala Pro Pro Arg Pro Arg Ala Glu Ala Asp Lys Ala Ser Asn Glu
                85                  90                  95
Met Glu Thr Lys Asp Asp Arg Val Ala Ile Val Gly Met Ser Ala Ile
            100                 105                 110
Leu Pro Cys Gly Glu Ser Val Arg Glu Ser Trp Glu Ala Ile Arg Glu
        115                 120                 125
Gly Leu Asp Cys Leu Gln Asp Leu Pro Ala Asp Arg Val Asp Ile Thr
    130                 135                 140
Ala Tyr Tyr Asp Pro Asn Lys Thr Thr Lys Asp Lys Ile Tyr Cys Lys
145                 150                 155                 160
Arg Gly Gly Phe Ile Pro Glu Tyr Asp Phe Asp Ala Arg Glu Phe Gly
 )              165                 170                 175
Leu Asn Met Phe Gln Met Glu Asp Ser Asp Ala Asn Gln Thr Val Thr
            180                 185                 190
Leu Leu Lys Val Lys Glu Ala Leu Glu Asp Ala Gly Val Glu Pro Phe
        195                 200                 205
Thr Lys Lys Lys Asn Ile Gly Cys Val Leu Gly Ile Gly Gly Gly
    210                 215                 220
Gln Lys Ala Ser His Glu Phe Tyr Ser Arg Leu Asn Tyr Val Val Val
225                 230                 235                 240
Glu Lys Val Leu Arg Lys Met Asn Leu Pro Asp Glu Val Val Glu Ala
            245                 250                 255
Ala Val Glu Lys Tyr Lys Ala Asn Phe Pro Glu Trp Arg Leu Asp Ser
            260                 265                 270
Phe Pro Gly Phe Leu Gly Asn Val Thr Ala Gly Arg Cys Ser Asn Val
    275                 280                 285
Phe Asn Met Glu Gly Met Asn Cys Val Val Asp Ala Ala Cys Ala Ser
    290                 295                 300
Ser Leu Ile Ala Ile Lys Val Ala Ile Asp Glu Leu Leu His Gly Asp
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Cys Asp Thr Met Ile Ala Gly Ala Thr Cys Thr Asp Asn Ser Ile Gly
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Met Tyr Met Ala Phe Ser Lys Thr Pro Val Phe Ser Thr Asp Gln Ser
                340                 345                 350
Val Lys Ala Tyr Asp Ala Lys Thr Lys Gly Met Leu Ile Gly Glu Gly
                355                 360                 365
Ser Ala Met Val Val Leu Lys Arg Tyr Ala Asp Ala Val Arg Asp Gly
        370                 375                 380
Asp Glu Ile His Ala Val Ile Arg Ala Cys Ala Ser Ser Ser Asp Gly
385                 390                 395                 400
Lys Ala Ala Gly Ile Tyr Ala Pro Thr Val Ser Gly Gln Glu Glu Ala
                405                 410                 415
Leu Arg Arg Ala Tyr Ala Arg Ala Gly Val Asp Pro Ser Thr Val Thr
                420                 425                 430
Leu Val Glu Gly His Gly Thr Gly Thr Pro Val Gly Asp Arg Ile Glu
        435                 440                 445
Leu Thr Ala Leu Arg Asn Val Phe Asp Ala Ala Asn Lys Gly Arg Lys
        450                 455                 460
Glu Thr Val Ala Val Gly Ser Ile Lys Ser Gln Ile Gly His Leu Lys
465                 470                 475                 480
Ala Val Ala Gly Phe Ala Gly Leu Val Lys Val Val Met Ala Leu Lys
                485                 490                 495
His Lys Thr Leu Pro Gln Thr Ile Asn Val His Asp Pro Pro Ala Leu
                500                 505                 510
His Asp Gly Ser Pro Ile Gln Asp Ser Ser Leu Tyr Ile Asn Thr Met
        515                 520                 525
Asn Arg Pro Trp Phe Thr Ala Pro Gly Val Pro Arg Arg Ala Gly Ile
        530                 535                 540
Ser Ser Phe Gly Phe Gly Gly Ala Asn Tyr His Ala Val Leu Glu Glu
545                 550                 555                 560
Ala Glu Pro Glu His Ala Lys Pro Tyr Arg Met Asn Gln Val Pro Gln
                565                 570                 575
Pro Val Leu Leu His Ala Ser Ser Ala Ser Ala Leu Ala Ser Ile Cys
        580                 585                 590
Asp Ala Gln Ala Asp Ala Leu Gln Ala Ala Val Ser Pro Glu Ala Ser
        595                 600                 605
Lys His Ala Asp Tyr Arg Ala Ile Val Ala Phe His Glu Ala Phe Lys
        610                 615                 620
Leu Arg Ala Gly Val Pro Ala Gly His Ala Arg Ile Gly Phe Val Ser
625                 630                 635                 640
Gly Ser Ala Ala Ala Thr Leu Ala Val Leu Arg Ala Ala Ser Ala Lys
                645                 650                 655
Leu Lys Gln Ser Ser Ala Thr Leu Glu Trp Thr Leu Leu Arg Glu Gly
                660                 665                 670
Val Thr Tyr Arg Ser Ala Ala Met His Thr Pro Gly Ser Val Ala Ala
        675                 680                 685
Leu Phe Ala Gly Gln Gly Ala Gln Tyr Thr His Met Phe Ala Asp Val
        690                 695                 700
Ala Met Asn Trp Pro Pro Phe Arg Ser Ala Val Gln Glu Met Asp Ala
705                 710                 715                 720
Ala Gln Val Thr Ala Ala Ala Pro Lys Arg Leu Ser Glu Val Leu Tyr
                725                 730                 735
Pro Arg Lys Pro Tyr Ala Ala Glu Pro Glu Gln Asp Asn Lys Ala Ile
                740                 745                 750
Ser Met Thr Ile Asn Ser Gln Pro Ala Leu Met Ala Cys Ala Ala Gly
        755                 760                 765
Ala Phe Glu Val Phe Arg Gln Ala Gly Leu Ala Pro Asp His Val Ala
        770                 775                 780
Gly His Ser Leu Gly Glu Phe Gly Ala Leu Leu Ala Ala Gly Cys Ala
```

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Ser Arg Glu Glu Leu Phe Arg Leu Val Cys Ser Arg Ala Lys Ala Met
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Gln Asp Val Pro Lys Pro Ser Glu Gly Val Met Ala Ala Val Ile Gly
                820                     825                     830
Arg Gly Ala Asp Lys Leu Thr Leu Gln Gly Asp Gly Ala Trp Leu Ala
                835                     840                     845
Asn Cys Asn Ser Pro Ser Gln Val Val Ile Ser Gly Asp Lys Thr Ala
        850                     855                     860
Val Glu Arg Glu Ser Ser Arg Leu Ala Gly Leu Gly Phe Arg Ile Ile
865                     870                     875                     880
Pro Leu Ala Cys Glu Gly Ala Phe His Ser Pro His Met Thr Ala Ala
                885                     890                     895
Gln Ala Thr Phe Gln Ala Ala Leu Asp Ser Leu Lys Ile Ser Thr Pro
                900                     905                     910
Thr Asn Gly Ala Arg Leu Tyr Asn Asn Val Ser Gly Lys Thr Cys Arg
                915                     920                     925
Ser Leu Gly Glu Leu Arg Asp Cys Leu Gly Lys His Met Thr Ser Pro
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Val Leu Phe Gln Ala Gln Val Glu Asn Met Tyr Ala Ala Gly Ala Arg
945                     950                     955                     960
Ile Phe Val Glu Phe Gly Pro Lys Gln Val Leu Ser Lys Leu Val Gly
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Glu Ile Leu Ala Asp Lys Ser Asp Phe Val Thr Val Ala Val Asn Ser
                980                     985                     990
Ser Ser Ser Lys Asp Ser Asp Val Gln Leu Arg Glu Ala Ala Ala Lys
        995                     1000                    1005
Leu Ala Val Leu Gly Val Pro Leu Ala Asn Phe Asp Pro Trp Glu Leu
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Cys Asp Ala Arg Arg Leu Arg Glu Cys Pro Arg Ser Lys Thr Thr Leu
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Arg Leu Ser Ala Ala Thr Tyr Val Ser Asn Lys Thr Leu Ala Ala Arg
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Glu Lys Val Met Glu Asp Asn Cys Asp Phe Ser Ser Leu Phe Ala Ser
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Gly Pro Ala Ser Gln Glu Met Glu Arg Glu Ile Ala Asn Leu Arg Ala
                1075                    1080                    1085
Glu Leu Glu Ala Ala Gln Arg Gln Leu Asp Thr Ala Lys Thr Gln Leu
                1090                    1095                    1100
Ala Arg Lys Gln Val Gln Asp Pro Thr Ala Asp Arg Gln Arg Asp Met
1105                    1110                    1115                    1120
Ile Ala Lys His Arg Ser Thr Leu Ala Ala Met Val Lys Glu Phe Glu
                1125                    1130                    1135
Ala Leu Ala Ser Gly Ser Pro Cys Ala Val Pro Phe Ala Pro Val Val
                1140                    1145                    1150
Asp Thr Ala Val Glu Asp Val Pro Phe Ala Asp Lys Val Ser Thr Pro
                1155                    1160                    1165
Pro Pro Gln Val Thr Ser Ala Pro Ile Ala Glu Leu Ala Arg Ala Glu
                1170                    1175                    1180
Ala Val Val Met Glu Val Leu Ala Ala Lys Thr Gly Tyr Glu Val Asp
1185                    1190                    1195                    1200
Met Ile Glu Ala Asp Met Leu Leu Asp Ala Glu Leu Gly Ile Asp Ser
                1205                    1210                    1215
Val Lys Arg Ile Glu Ile Leu Ala Ala Val Gln Ala Gln Leu Gly Val
                1220                    1225                    1230
Glu Ala Lys Asp Val Asp Ala Leu Ser Arg Thr Arg Thr Val Gly Glu
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Val Val Asp Ala Met Lys Ala Glu Ile Gly Gly Gln Ala Thr Ser Ala
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Thr Ala Ser Val Leu Pro Lys Pro Val Ala Leu Pro Ala Ser Val Asp
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Pro Ala Lys Leu Ala Arg Ala Glu Ala Val Val Met Glu Val Leu Ala
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Ala Lys Thr Gly Tyr Glu Val Asp Met Ile Glu Ala Asp Met Leu Leu
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Asp Ala Glu Leu Gly Ile Asp Ser Val Lys Arg Ile Glu Ile Leu Ala
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Ile Gly Gly Gln Ala Thr Ser Ala Pro Ala Ser Val Ala Gln Pro Gln
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Ala Ser Ala Pro Ser Pro Ser Ala Thr Thr Ala Ser Val Leu Pro Lys
         1395            1400            1405
Pro Val Ala Ala Pro Thr Ser Ala Asp Pro Ala Lys Leu Ala Arg Ala
         1410            1415            1420
Glu Ala Val Val Met Glu Val Leu Ala Ala Lys Thr Gly Tyr Glu Val
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Asp Met Ile Glu Ala Asp Met Leu Leu Asp Ala Glu Leu Gly Ile Asp
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Ser Val Lys Arg Ile Glu Ile Leu Ala Ala Val Gln Ala Gln Leu Gly
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Val Glu Ala Lys Asp Val Asp Ala Leu Ser Arg Thr Arg Thr Val Gly
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Glu Val Val Glu Ala Met Lys Ala Glu Ile Gly Gly Gln Ala Thr Ser
         1490            1495            1500
Ala Pro Ala Ser Val Ala Gln Pro Gln Ile Ser Val Ser Pro Thr Pro
1505            1510            1515            1520
Leu Ala Ala Ser Pro Ser Ala Asp Pro Ala Lys Leu Ala Arg Ala Glu
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Ala Val Val Met Glu Val Leu Ala Ala Lys Thr Gly Tyr Glu.Val Asp
         1540            1545            1550
Met Ile Glu Ala Asp Met Leu Leu Asp Ala Glu Leu Gly Ile Asp Ser
         1555            1560            1565
Val Lys Arg Ile Glu Ile Leu Ala Ala Val Gln Ala Gln Léu Gly Val
         1570            1575            1580
Glu Ala Lys Asp Val Asp Ala Leu Ser Arg Thr Arg Thr Val Gly Glu
1585            1590            1595            1600
Val Val Asp Ala Met Lys Ala Glu Ile Gly Gly Gln Ala Thr Ser Ala
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Pro Ala Ser Val Ala Gln Pro Gln Ala Ser Ala Pro Ser Pro Ser Ala
         1620            1625            1630
Thr Ala Ser Val Leu Pro Lys Pro Val Ala Ala Pro Thr Ser Ala Asp
         1635            1640            1645
Pro Ala Lys Leu Ala Arg Ala Glu Ala Val Val Met Glu Val Leu Ala
         1650            1655            1660
Ala Lys Thr Gly Tyr Glu Val Asp Met Ile Glu Ala Asp Met Leu Leu
1665            1670            1675            1680
Asp Ala Glu Leu Gly Ile Asp Ser Val Lys Arg Ile Glu Ile Leu Ala
         1685            1690            1695
Ala Val Gln Ala Gln Leu Gly Val Glu Ala Lys Asp Val Asp Ala Leu
         1700            1705            1710
Ser Arg Thr Arg Thr Val Gly Glu Val Val Glu Ala Met Lys Ala Glu
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Ile Gly Gly Gln Ala Thr Ser Ala Pro Ala Ser Met Ala Gln Pro Gln
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          1730                1735                 1740
Ile Ser Val Ser Pro Thr Pro Leu Ala Ala Ser Pro Ser Ala Asp Pro
1745                1750                1755                 1760
Ala Lys Leu Ala Arg Ala Glu Ala Val Val Met Glu Val Leu Ala Ala
          1765                1770                1775
Lys Thr Gly Tyr Glu Val Asp Met Ile Glu Ala Asp Met Leu Leu Asp
          1780                1785                1790
Ala Glu Leu Gly Ile Asp Ser Val Lys Arg Ile Glu Ile Leu Ala Ala
          1795                1800                1805
Val Gln Ala Gln Leu Gly Val Glu Ala Lys Asp Val Asp Ala Leu Ser
          1810                1815                1820
Arg Thr Arg Thr Val Gly Glu Val Val Asp Ala Met Lys Ala Glu Ile
1825                1830                1835                 1840
Gly Gly Gln Ala Thr Ser Ala Pro Ala Ser Val Ala Gln Pro Gln Ala
          1845                1850                1855
Ser Ala Pro Ser Pro Ser Ala Thr Ala Ser Ala Pro Val Thr Pro Leu
          1860                1865                1870
Ala Ala Pro Ala Ser Val Asp Pro Ala Lys Leu Ala Arg Ala Glu Ala
          1875                1880                1885
Val Val Met Glu Val Leu Ala Ala Lys Thr Gly Tyr Glu Val Asp Met
          1890                1895                1900
Ile Glu Ala Asp Met Leu Leu Asp Ala Glu Leu Gly Ile Asp Ser Val
1905                1910                1915                 1920
Lys Arg Ile Glu Ile Leu Ala Ala Val Gln Ala Gln Leu Gly Val Glu
          1925                1930                1935
Ala Lys Asp Val Asp Ala Leu Ser Arg Thr Arg Thr Val Gly Glu Val
          1940                1945                1950
Val Asp Ala Met Lys Ala Glu Ile Gly Gly Gln Ala Thr Ser Ala Pro
          1955           '    1960                1965
Ala Ser Val Ala Gln Pro Gln Ala Ser Ala Pro Ser Pro Ser Ala Thr
          1970                1975                1980
Ala Ser Val Leu Pro Lys Pro Val Ala Ser Pro Ala Ser Val Asp Pro
1985                1990                1995                 2000
Ala Lys Leu Ala Arg Ala Glu Ala Val Val Met Glu Val Leu Ala Ala
          2005                2010                2015
Lys Thr Gly Tyr Glu Val Asp Met Ile Asp Ala Asp Met Leu Leu Asp
          2020                2025                2030
Ala Glu Leu Gly Ile Asp Ser Val Lys Arg Ile Glu Ile Leu Ala Ala
          2035                2040                2045
Val Gln Ala Gln Leu Gly Val Glu Ala Lys Asp Val Asp Ala Leu Ser
          2050                2055                2060
Arg Thr Arg Thr Val Gly Glu Val Val Glu Ala Met Lys Ala Glu Ile
2065                2070                2075                 2080
Gly Ala Ala Gly Pro Asn Asp Ala Gln Ala Ala Ser Gly His Leu Phe
          2085                2090                2095
Gly Thr Gly Cys Glu Asp Leu Ser Leu Cys Ser Ala Ser Val Val Glu
          2100                2105                2110
Ile Ala Arg Cys Ser Glu Leu Ala Leu Glu Arg Pro Met Asp Arg Pro
          2115                2120                2125
Ile Leu Ile Val Ser Asp Gly Ser Ala Leu Pro Ala Ala Leu Ala Ser
          2130                2135      ·         2140
Arg Leu Gly Ser Cys Ala Val Ile Leu Thr Thr Ala Gly Glu Thr Asp
2145                2150                2155                 2160
Gln Ser Val Arg Ser Thr Lys His Val Asp Met Glu Gly Trp Gly Glu
          2165                2170                2175
Ala Asp Leu Val Arg Ala Leu Glu Ala Val Glu Ser Arg Phe Gly Val
          2180       ⌐        2185                2190
Pro Gly Gly Val Val Val Leu Glu Arg Ala Ser Glu Thr Ala Arg Asp
          2195                2200                2205
```

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Gln Leu Gly Phe Ala Leu Leu Leu Ala Lys His Ser Ser Lys Ala Leu
    2210                2215                2220
Asn Gln Gln Ile Pro Gly Gly Arg Ala Cys Phe Val Gly Val Ser Arg
2225                2230                2235                2240
Ile Asp Gly Lys Leu Gly Leu Ser Gly Ala Cys Ala Lys Gly Lys Gly
                2245                2250                2255
Trp Ala Glu Ala Ala Glu Ile Ala Gln Gln Gly Ala Val Ala Gly Leu
                2260                2265                2270
Cys Lys Thr Leu Asp Leu Glu Trp Pro His Val Phe Ala Arg Ser Ile
                2275                2280                2285
Asp Ile Glu Leu Gly Ala Asn Glu Glu Thr Ala Ala Gln Ala Ile Phe
                2290                2295                2300
Glu Glu Leu Ser Cys Pro Asp Leu Thr Val Arg Glu Ala Gly Tyr Thr
2305                2310                2315                2320
Lys Asp Gly Lys Arg Trp Thr Thr Glu Ala Arg Pro Val Gly Leu Gly
                2325                2330                2335
Lys Pro Lys Gln Ala Leu Arg Ser Ser Asp Val Phe Leu Val Ser Gly
                2340                2345                2350
Gly Ala Arg Gly Ile Thr Pro Val Cys Val Arg Glu Leu Ala Lys Ser
                2355                2360                2365
Ile Ser Gly Gly Thr Phe Val Leu Leu Gly Arg Ser Pro Leu Ala Asp
                2370                2375                2380
Asp Pro Ala Trp Ala Cys Gly Val Glu Glu Ala Asn Ile Gly Thr Ala
2385                2390                2395                2400
Ala Met Ala His Leu Lys Ala Glu Phe Ala Ala Gly Arg Gly Pro Lys
                2405                2410                2415
Pro Thr Pro Lys Ala His Lys Ala Leu Val Gly Ser Val Leu Gly Ala
                2420                2425                2430
Arg Glu Val Leu Gly Ser Leu Glu Ser Ile Arg Ala Gln Gly Ala Arg
                2435                2440                2445
Ala Glu Tyr Val Ser Cys Asp Val Ser Cys Ala Glu Arg Val Lys Ala
                2450                2455                2460
Val Val Asp Asp Leu Glu Arg Arg Val Gly Ala Val Thr Gly Val Val
2465                2470                2475                2480
His Ala Ser Gly Val Leu Arg Asp Lys Ser Val Glu Arg Leu Glu Leu
                2485                2490                2495
Ala Asp Phe Glu Val Val Tyr Gly Thr Lys Val Asp Gly Leu Leu Asn
                2500                2505                2510
Leu Leu Gln Ala Val Asp Arg Pro Lys Leu Arg His Leu Val Leu Phe
                2515                2520                2525
Ser Ser Leu Ala Gly Phe His Gly Asn Thr Gly Gln Ala Val Tyr Ala
                2530                2535                2540
Met Ala Asn Glu Ala Leu Asn Lys Met Ala Phe His Leu Glu Thr Ala
2545                2550                2555                2560
Met Pro Gly Leu Ser Val Lys Thr Ile Gly Phe Gly Pro Trp Asp Gly
                2565                2570                2575
Gly Met Val Asn Asp Ala Leu Lys Ala His Phe Ala Ser Met Gly Val
                2580                2585                2590
Gln Ile Ile Pro Leu Asp Gly Gly Ala Glu Thr Val Ser Arg Ile Ile
                2595                2600                2605
Gly Ala Cys Ser Pro Thr Gln Val Leu Val Gly Asn Trp Gly Leu Pro
                2610                2615                2620
Pro Val Val Pro Asn Ala Ser Val His Lys Ile Thr Val Arg Leu Gly
2625                2630                2635                2640
Gly Glu Ser Ala Asn Pro Phe Leu Ser Ser His Thr Ile Gln Gly Arg
                2645                2650                2655
Lys Val Leu Pro Met Thr Val Ala Leu Gly Leu Leu Ala Glu Ala Ala
                2660                2665                2670
Arg Gly Leu Tyr Val Gly His Gln Val Val Gly Ile Glu Asp Ala Gln
```

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            2675                    2680                    2685
Val Phe Gln Gly Val Val Leu Asp Lys Gly Ala Thr Cys Glu Val Gln
      2690                    2695                    2700
Leu Arg Arg Glu Ser Ser Thr Ala Ser Pro Ser Glu Val Val Leu Ser
2705                    2710                    2715                    2720
Ala Ser Leu Asn Val Phe Ala Ala Gly Lys Val Val Pro Ala Tyr Arg
                  2725                    2730                    2735
Ala His Val Val Leu Gly Ala Ser Gly Pro Arg Thr Gly Gly Val Gln
            2740                    2745                    2750
Leu Glu Leu Lys Asp Leu Gly Val Asp Ala Asp Pro Ala Cys Ser Val
            2755                    2760                    2765
Gly Lys Gly Ala Leu Tyr Asp Gly Arg Thr Leu Phe His Gly Pro Ala
      2770                    2775                    2780
Phe Gln Tyr Met Asp Glu Val Leu Arg Cys Ser Pro Ala Glu Leu Ala
2785                    2790                    2795                    2800
Val Arg Cys Arg Val Val Pro Ser Ala Ala Gln Asp Arg Gly Gln Phe
                  2805                    2810                    2815
Val Ser Arg Gly Val Leu Tyr Asp Pro Phe Leu Asn Asp Thr Val Phe
            2820                    2825                    2830
Gln Ala Leu Leu Val Trp Ala Arg Leu Val Arg Asp Ser Ala Ser Leu
      2835                    2840                    2845
Pro Ser Asn Val Glu Arg Ile Ser Phe His Gly Gln Pro Pro Ser Glu
      2850                    2855                    2860
Gly Glu Val Phe Tyr Thr Thr Leu Lys Leu Asp Ser Ala Ala Ser Gly
2865                    2870                    2875                    2880
Pro Leu Asp Pro Ile Ala Lys Ala Gln Phe Phe Leu His Arg Ala Cys
                  2885                    2890                    2895
Gly Ala Val Phe Ala Ser Gly Arg Ala Ser Val Val Leu Asn Lys Ala
            2900                  . 2905                    2910
Leu Ser Phe
      2915
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<210> 11
<211> 2040
<212> PRT
<213> T. aureum

<400> 11
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Gln Ala Ile Gly His Arg Ala Ala Arg Trp Ser Cys Arg Ser Lys Ser
 1               5                   10                  15
Lys Ala Arg Gly His Lys Ala Gln Lys Glu Met Asn Gln Gly Gly Arg
            20                  25                  30
Asn Asp Glu Gly Val Ser Val Ala Arg Ala Asp Pro Cys Pro Asp Thr
      35                  40                  45
Arg Ile Ala Val Val Gly Met Ala Val Glu Tyr Ala Gly Cys Arg Gly
      50                  55                  60
Lys Glu Ala Phe Trp Asp Thr Leu Met Asn Gly Lys Ile Asn Ser Ala
65                  70                  75                  80
Cys Ile Ser Asp Asp Arg Leu Gly Ser Ala Arg Arg Glu Glu His Tyr
                  85                  90                  95
Ala Pro Glu Arg Ser Lys Tyr Ala Asp Thr Phe Cys Asn Glu Arg Tyr
            100                 105                 110
Gly Cys Ile Asp Pro Lys Val Asp Asn Glu His Asp Leu Leu Leu Gly
            115                 120                 125
Leu Ala Ala Ala Ala Leu Gln Asp Ala Gln Asp Arg Arg Ser Asp Gly
      130                 135                 140
Gly Lys Phe Asp Pro Ala Gln Leu Lys Arg Cys Gly Ile Val Ser Gly
145                 150                 155                 160
Cys Leu Ser Phe Pro Met Asp Asn Leu Gln Gly Glu Leu Leu Asn Leu
```

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                        165                       170                       175
Tyr Gln Ala His Ala Glu Arg Arg Ile Gly Lys His Cys Phe Ala Asp
        180                       185                   190
Gln Thr Pro Trp Ser Thr Arg Thr Arg Ala Leu His Pro Leu Pro Gly
        195                       200                   205
Asp Pro Arg Thr His Arg Asp Pro Ala Ser Phe Val Ala Gly Gln Leu
    210                       215                   220
Gly Leu Gly Pro Leu His Tyr Ser Leu Asp Ala Ala Cys Ala Ser Ala
225                       230                   235                   240
Leu Tyr Val Leu Arg Leu Ala Gln Asp His Leu Leu Ser Gly Glu Ala
            245                       250                   255
Asp Leu Met Leu Cys Gly Ala Thr Cys Phe Pro Glu Pro Phe Phe Ile
        260                       265                   270
Leu Thr Gly Phe Ser Thr Phe His Ala Met Pro Val Gly Glu Asn Gly
        275                   280                   285
Val Ser Met Pro Phe His Arg Asp Thr Gln Gly Leu Thr Pro Gly Glu
    290                       295                   300
Gly Gly Ser Val Met Val Leu Lys Arg Leu Ala Asp Ala Glu Arg Asp
305                       310                   315                   320
Gly Asp His Ile Tyr Gly Thr Leu Leu Gly Ala Ser Leu Ser Asn Ala
            325                       330                   335
Gly Cys Gly Leu Pro Leu Lys Pro His Gln Pro Ser Glu Glu Ala Cys
        340                       345                   350
Leu Lys Ala Thr Tyr Glu Leu Val Gly Val Pro Pro Arg Asp Val Gln
        355                       360                   365
Tyr Val Glu Cys His Ala Thr Gly Thr Pro Gln Gly Asp Thr Val Glu
    370                       375                   380
Leu Gln Ala Val Lys Ala Cys Phe Glu Gly Ala Ser Pro Arg Ile Gly
385                       390                   395                   400
Ser Thr Lys Gly Asn Phe Gly His Thr Leu Val Ala Ala Gly Phe Ala
            405                       410                   415
Gly Met Cys Lys Val Leu Leu Ala Met Glu Arg Gly Val Ile Pro Pro
        420                       425                   430
Thr Pro Gly Val Asp Ser Gly Thr Gln Ile Asp Pro Leu Val Val Thr
        435                       440                   445
Ala Ala Leu Pro Trp Pro Asp Thr Arg Gly Gly Pro Lys Arg Ala Gly
    450                       455                   460
Leu Ser Ala Phe Gly Phe Gly Gly Thr Asn Ala His Ala Val Phe Glu
465                       470                   475                   480
Glu His Ile Pro Ser Arg Ala Pro Pro Ala Val Leu Cys Gln Pro Arg
            485                       490                   495
Leu Gly Ser Gly Pro Asn Arg Lys Leu Ala Ile Val Gly Met Asp Ala
        500                       505                   510
Thr Phe Gly Ser Leu Lys Gly Leu Ser Ala Leu Glu Ala Ala Leu Tyr
        515                       520                   525
Glu Ala Arg His Ala Ala Arg Pro Leu Pro Ala Lys Arg Trp Arg Phe
    530                       535                   540
Leu Gly Gly Asp Glu Ser Phe Leu His Glu Ile Gly Leu Glu Cys Ser
545                       550                   555                   560
Pro His Gly Cys Tyr Ile Glu Asp Val Asp Val Asp Phe Lys Arg Leu
            565                       570                   575
Arg Thr Pro Met Val Pro Glu Asp Leu Leu Arg Pro Gln Gln Leu Leu
        580                       585                   590
Ala Val Ser Thr Ile Asp Lys Ala Ile Leu Asp Ser Gly Leu Ala Lys
        595                       600                   605
Gly Gly Asn Val Ala Val Leu Val Gly Leu Gly Thr Asp Leu Glu Leu
    610                       615                   620
Tyr Arg His Arg Ala Arg Val Ala Leu Lys Glu Arg Leu Gln Gly Leu
625                       630                   635                   640
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Val Arg Ser Ala Glu Gly Gly Ala Leu Thr Ser Arg Leu Met Asn Tyr
            645             650                 655
Ile Asn Asp Ser Gly Thr Ser Thr Ser Tyr Thr Ser Tyr Ile Gly Asn
            660             665                 670
Leu Val Ala Thr Arg Val Ser Ser Gln Trp Gly Phe Thr Gly Pro Ser
        675             680             685
Phe Thr Val Thr Glu Gly Ala Asn Ser Val His Arg Cys Ala Gln Leu
    690             695             700
Ala Lys Tyr Met Leu Asp Arg Gly Glu Val Asp Ala Val Val Val Ala
705             710             715                 720
Gly Val Asp Leu Cys Gly Ser Ala Glu Ala Phe Phe Val Arg Ser Arg
            725             730             735
Arg Met Gln Ile Ser Lys Ser Gln Arg Pro Ala Ala Pro Phe Asp Arg
            740             745             750
Ala Ala Asp Gly Phe Phe Ala Gly Glu Gly Cys Gly Ala Leu Val Phe
            755             760             765
Lys Arg Leu Thr Asp Cys Val Ser Gly Glu Arg Ile Tyr Ala Ser Leu
    770             775             780
Asp Ser Val Val Val Ala Thr Thr Pro Arg Ala Ala Leu Arg Ala Ala
785             790             795                 800
Ala Gly Ser Ala Arg Val Asp Pro Ala Ser Ile Asp Met Val Glu Leu
            805             810             815
Ser Ala Asp Ser His Arg Phe Val Arg Ala Pro Gly Thr Val Ala Gln
            820             825             830
Pro Leu Thr Ala Glu Val Glu Val Gly Ala Val Arg Glu Val Ile Gly
        835             840             845
Thr Ala Gly Arg Gly Ser Arg Ser Val Ala Val Gly Ser Val Arg Ala
    850             855             860
Asn Val Gly Asp Ala Gly Phe Ala Ser Gly Ala Ala Ala Leu Val Lys
865             870             875                 880
Thr Ala Leu Cys Leu His Asn Arg Tyr Leu Ala Ala Thr Pro Gly Trp
            885             890             895
Asp Ala Pro Ala Ala Gly Val Asp Phe Gly Ala Glu Leu Tyr Val Cys
            900             905             910
Arg Glu Ser Arg Ala Trp Val Lys Asn Ala Gly Val Ala Arg His Ala
            915             920             925
Ala Ile Ser Gly Val Asp Glu Gly Gly Ser Cys Tyr Gly Leu Val Leu
    930             935             940
Ser Asp Val Pro Gly Gln Tyr Glu Thr Gly Asn Arg Ile Ser Leu Gln
945             950             955                 960
Ala Glu Ser Pro Lys Leu Leu Leu Leu Ser Ala Pro Asp His Ala Ala
            965             970             975
Leu Leu Asp Lys Val Ala Ala Glu Leu Ala Ala Leu Glu Gln Ala Asp
            980             985             990
Gly Leu Ser Ala Ala Ala Ala Val Asp Arg Leu Leu Gly Glu Ser
            995             1000            1005
Leu Val Gly Cys Ala Ala Gly Ser Gly Gly Leu Thr Leu Cys Leu Val
    1010            1015            1020
Ala Ser Pro Ala Ser Leu His Lys Glu Leu Ala Leu Ala His Arg Gly
1025            1030            1035            1040
Ile Pro Arg Cys Ile Lys Ala Arg Arg Asp Trp Ala Ser Pro Ala Gly
            1045            1050            1055
Ser Tyr Phe Ala Pro Glu Pro Ile Ala Ser Asp Arg Val Ala Phe Met
            1060            1065            1070
Tyr Gly Glu Gly Arg Ser Pro Tyr Cys Gly Val Gly Arg Asp Leu His
        1075            1080            1085
Arg Ile Trp Pro Ala Leu His Glu Arg Val Asn Ala Lys Thr Val Asn
    1090            1095            1100
Leu Trp Gly Asp Gly Asp Ala Trp Leu Leu Pro Arg Ala Thr Ser Ala
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1105                    1110                    1115                    1120
Glu Glu Glu Glu Gln Leu Cys Arg Asn Phe Asp Ser Asn Gln Val Glu
                    1125                    1130                    1135
Met Phe Arg Thr Gly Val Tyr Ile Ser Met Cys Leu Thr Asp Leu Ala
           1140                    1145                    1150
Arg Ser Leu Ile Gly Leu Gly Pro Lys Ala Ser Phe Gly Leu Ser Leu
           1155                    1160                    1165
Gly Glu Val Ser Met Leu Phe Ala Leu Ser Glu Ser Asn Cys Arg Leu
       1170                    1175                    1180
Ser Glu Glu Met Thr Arg Arg Leu Arg Ala Ser Pro Val Trp Asn Ser
1185                    1190                    1195                    1200
Glu Leu Ala Val Glu Phe Asn Ala Leu Arg Lys Leu Trp Gly Val Ala
                    1205                    1210                    1215
Pro Gly Ala Pro Val Asp Ser Phe Trp Gln Gly Tyr Val Val Arg Ala
           1220                    1225                    1230
Thr Arg Ala Gln Val Glu Gln Ala Ile Gly Glu Asp Asn Gln Phe Val
           1235                    1240                    1245
Arg Leu Leu Ile Val Asn Asp Ser Gln Ser Val Leu Ile Ala Gly Lys
       1250                    1255                    1260
Pro Ala Ala Cys Glu Ala Val Ile Ala Arg Ile Gly Ser Ile Leu Pro
1265                    1270                    1275                    1280
Pro Leu Gln Val Ser Gln Gly Met Val Gly His Cys Ala Glu Val Leu
                    1285                    1290                    1295
Pro Tyr Thr Ser Glu Ile Gly Arg Ile His Asn Met Leu Arg Phe Pro
           1300                    1305                    1310
Ser Gln Asp Glu Thr Gly Gly Cys Lys Met Tyr Ser Ser Val Ser Asn
       1315                    1320                    1325
Ser Arg Ile Gly Pro Val Glu Glu Ser Gln Met Gly Pro Gly Thr Glu
       1330                    1335                    1340
Leu Val Phe Ser Pro Ser Met Glu Asp Phe Val Ala Gln Leu Tyr Ser
1345                    1350    .               1355                    1360
Arg Val Ala Asp Phe Pro Ala Ile Thr Glu Ala Val Tyr Gln Gln Gly
                    1365                    1370                    1375
His Asp Val Phe Val Glu Val Gly Pro Asp His Ser Arg Ser Ala Ala
           1380                    1385                    1390
Val Arg Ser Thr Leu Gly Pro Thr Arg Arg His Ile Ala Val Ala Met
           1395                    1400                    1405
Asp Arg Lys Gly Glu Ser Ala Trp Ser Gln Leu Leu Lys Met Leu Ala
       1410                    1415                    1420
Thr Leu Ala Ser His Arg Val Pro Gly Leu Asp Leu Ser Ser Met Tyr
1425                    1430                    1435                    1440
His Pro Ala Val Val Glu Arg Cys Arg Leu Ala Leu Ala Ala Gln Arg
                    1445                    1450                    1455
Ser Gly Gln Pro Glu Gln Arg Asn Lys Phe Leu Arg Thr Ile Glu Val
           1460                    1465                    1470
Asn Gly Phe Tyr Asp Pro Ala Asp Ala Thr Ile Pro Glu Ala Val Ala
       1475                    1480                    1485
Thr Ile Leu Pro Ala Thr Ala Ala Ile Ser Pro Pro Lys Leu Gly Ala
       1490                    1495                    1500
Pro His Asp Ser Gln Pro Glu Ala Glu Ala Arg Pro Val Gly Glu Ala
1505                    1510                    1515                    1520
Ser Val Pro Arg Arg Ala Thr Ser Ser Ser Lys Leu Ala Arg Thr Leu
               1525                    1530                    1535
Ala Ile Asp Ala Cys Asp Ser Asp Val Arg Ala Ala Leu Leu Asp Leu
           1540                    1545                    1550
Asp Ala Pro Ile Ala Val Gly Gly Ser Ser Arg Ala Gln Val Pro Pro
       1555                    1560                    1565
Cys Pro Val Ser Ala Leu Gly Ser Ala Ala Phe Arg Ala Ala His Gly
       1570                    1575                    1580
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Val Asp Tyr Ala Leu Tyr Met Gly Ala Met Ala Lys Gly Val Ala Ser
1585                1590                1595                1600
Ala Glu Met Val Ile Ala Ala Gly Lys Ala Arg Met Leu Ala Ser Phe
                ·1605                1610                1615
Gly Ala Gly Gly Leu Pro Leu Gly Glu Val Glu Glu Ala Leu Asp Lys
            1620                1625                1630
Ile Gln Ala Ala Leu Pro Glu Gly Pro Phe Ala Val Asn Leu Ile His
            1635                1640                1645
Ser Pro Phe Asp Pro Asn Leu Glu Glu Gly Asn Val Glu Leu Phe Leu
            1650                1655                1660
Arg Arg Gly Ile Arg Leu Val Glu Ala Ser Ala Phe Met Ser Val Thr
1665                1670                1675                1680
Pro Ser Leu Val Arg Tyr Arg Val Ala Gly Leu Glu Arg Gly Pro Gly
                1685                1690                1695
Gly Thr Ala Arg Val Leu Asn Arg Val Ile Gly Lys Val Ser Arg Ala
            1700                1705                1710
Glu Leu Ala Glu Met Phe Met Arg Pro Pro Ala Ala Ile Val Ser
            1715                1720                1725
Lys Leu Leu Ala Gln Gly Leu Val Thr Glu Glu Gln Ala Ser Leu Ala
            1730                1735                1740
Glu Ile Val Pro Leu Val Asp Asp Val Ala Ile Glu Ala Asp Ser Gly
1745                1750                1755                1760
Gly His Thr Asp Asn Arg Pro Ile His Val Val Leu Pro Val Val Leu
                1765                1770                1775
Ala Leu Arg Asp Arg Val Met Arg Glu Cys Lys Tyr Pro Ala Ala Asn
            1780                1785                1790
Arg Val Arg Val Gly Ala Gly Gly Gly Ile Gly Cys Pro Ala Ala Ala
            1795                1800                1805
Arg Ala Ala Phe Asp Met Gly Ala Ala Phe Val Leu Thr Gly Ser Ile
            1810                1815                1820
Asn Gln Leu Thr Arg Gln Ala Gly Thr Ser Asp Ser Val Arg Ala Ala
1825                1830                1835                1840
Leu Ala Arg Ala Thr Tyr Ser Asp Val Thr Met Ala Pro Ala Ala Asp
                1845                1850                1855
Met Phe Asp Gln Gly Val Lys Leu Gln Val Leu Lys Arg Gly Thr Met
                1860                1865                1870
Phe Pro Ala Arg Ala Asn Lys Leu Tyr Glu Leu Phe Thr Thr Tyr Gln
            1875                1880                1885
Ser Leu Asp Ala Ile Pro Arg Ala Glu Leu Ala Arg Leu Glu Lys Arg
            1890                1895                1900
Val Phe Arg Met Ser Ile Asp Glu Val Trp Asn Glu Thr Lys Gln Phe
1905                1910                1915                1920
Tyr Glu Thr Arg Leu Asn Asn Pro Ala Lys Val Ala Arg Ala Glu Arg
                1925                1930                1935
Asp Pro Lys Leu Lys Met Ser Leu Cys Phe Arg Trp Tyr Leu Ser Lys
            1940                1945                1950
Ser Ser Lys Trp Ala Ser Thr Gly Gln Val Gly Arg Glu Leu Asp Tyr
            1955                1960                1965
Gln Val Trp Cys Gly Pro Thr Ile Gly Ala Phe Asn Glu Phe Val Lys
            1970                1975                1980
Gly Ser Ser Leu Asp Ala Glu Ala Cys Gly Gly Arg Phe Pro Cys Val
1985                1990                1995                2000
Val Arg Val Asn Gln Glu Ile Leu Cys Gly Ala Ala Tyr Glu Gln Arg
                2005                2010                2015
Leu Ala Arg Phe Met Leu Leu Ala Gly Arg Glu Ser Ala Asp Ala Leu
            2020                2025                2030
Ala Tyr Thr Val Ala Glu Ala Arg
            2035                2040

<210> 12
<211> 1476
<212> DNA
<213> T. aureum

<400> 12

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gagtcagtgc gcgagtcgtg ggaggcgatt cgcgaggggc tcgattgcct gcaggacctg     120
cctgcggacc gagtcgatat cacggcgtac tacgacccga caagacaac caaggacaag       180
atctactgca agcgcggcgg cttcattccc gagtatgact ttgacgcgcg cgagttcggc     240
ctcaacatgt tccagatgga ggactcggac gccaaccaaa ccgtgacttt gctcaaggtc     300
aaggaggctc tcgaggacgc cggggtggag cccttcacaa agaagaagaa gaacattggc     360
tgcgtgctcg gcatcggcgg cgggcagaag gcgagccacg agttttactc ccgactcaac     420
tatgtggtcg tggagaaggt gcttcgcaag atgaacctcc ccgacgaggt tgtcgaggcc     480
gccgtcgaaa agtacaaggc caactttcct gaatggcgcc tcgactcgtt ccctgggttt     540
cttggcaacg tgaccgccgg gcggtgcagc aacgtcttca acatggaagg catgaactgc     600
gtcgtggacg ctgcgtgcgc cagctcgctc atcgcgatca aggttgccat tgatgagctc     660
ctccacgggg actgcgacac catgattgcc ggtgcgacct gcaccgacaa ctcgatcggg     720
atgtacatgg ccttttccaa aaccccagtt ttctccaccg accagagcgt caaggcgtac     780
gacgccaaga cgaaaggcat gctcatcggc gaaggctcgg ccatggtcgt gctcaagcgg     840
tacgcggacg ccgttcggga tggtgatgag atccatgccg tcatcagggc atgcgcctcg     900
tccagcgacg gcaaggctgc tggcatttac gcaccgacgg tgtcgggtca agaagaggca     960
ctgcggcgcg cgtacgcccg agctggcgtg gacccctcca ccgtcacgct ggtggagggc    1020
cacggcactg gcacacccgt cggggaccgg attgagctga ccgccttgcg caacgtcttt    1080
gacgcagcca acaaaggccg caaggaaaca gtcgcggtgg aagcatcaa gtcgcagatc     1140
ggtcacctga aggccgtggc cggctttgcc ggtctcgtca aggttgtcat ggccctcaag    1200
cacaagacgc tgccgcagac catcaacgtt cacgacccgc ccgcactgca cgacggctcg    1260
cccatccagg attcgagtct ttacatcaac acgatgaacc ggccctggtt tacggcacct    1320
ggcgtccccc gccgtgcagg catctctagc tttgggtttg gcggcgccaa ctaccacgct    1380
gttctcgaag aggccgagcc tgagcacgcg aagccgtatc gcatgaacca agttccacaa    1440
ccggtgctct tgcacgcaag ctccgcgtca gctctt                             1476
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<210> 13
<211> 482
<212> PRT
<213> T. aureum

<400> 13

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Met Glu Thr Lys Asp Asp Arg Val Ala Ile Val Gly Met Ser Ala Ile
 1               5                  10                  15
Leu Pro Cys Gly Glu Ser Val Arg Glu Ser Trp Glu Ala Ile Arg Glu
            20                  25                  30
Gly Leu Asp Cys Leu Gln Asp Leu Pro Ala Asp Arg Val Asp Ile Thr
        35                  40                  45
Ala Tyr Tyr Asp Pro Asn Arg Gly Gly Phe Ile Pro Glu Tyr Asp Phe
    50                  55                  60
Asp Ala Arg Glu Phe Gly Leu Asn Met Phe Gln Met Glu Asp Ser Asp
65                  70                  75                  80
Ala Asn Gln Thr Val Thr Leu Leu Lys Val Lys Glu Ala Leu Glu Asp
                85                  90                  95
Ala Gly Val Glu Pro Phe Thr Lys Lys Lys Asn Ile Gly Cys Val
                100                 105                 110
Leu Gly Ile Gly Gly Gly Gln Lys Ala Ser His Glu Phe Tyr Ser Arg
        115                 120                 125
Leu Asn Tyr Val Val Val Glu Lys Val Leu Arg Lys Met Asn Leu Pro
    130                 135                 140
Asp Glu Val Val Glu Ala Ala Val Glu Lys Tyr Lys Ala Asn Phe Pro
145                 150                 155                 160
Glu Trp Arg Leu Asp Ser Phe Pro Gly Phe Leu Gly Asn Val Thr Ala
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```
                   165                    170                    175
Gly Arg Cys Ser Asn Val Phe Asn Met Glu Gly Met Asn Cys Val Val
            180                    185                    190
Asp Ala Ala Cys Ala Ser Ser Leu Ile Ala Ile Lys Val Ala Ile Asp
        195                    200                    205
Glu Leu Leu His Gly Asp Cys Asp Thr Met Ile Ala Gly Ala Thr Cys
    210                    215                    220
Thr Asp Asn Ser Ile Gly Met Tyr Met Ala Phe Ser Lys Thr Pro Val
225                    230                    235                    240
Phe Ser Thr Asp Gln Ser Val Lys Ala Tyr Asp Ala Lys Thr Lys Gly
                245                    250                    255
Met Leu Ile Gly Glu Gly Ser Ala Met Val Val Leu Lys Arg Tyr Ala
            260                    265                    270
Asp Ala Val Arg Asp Gly Asp Glu Ile His Ala Val Ile Arg Ala Cys
        275                    280                    285
Ala Ser Ser Ser Asp Gly Lys Ala Ala Gly Ile Tyr Ala Pro Thr Val
    290                    295                    300
Ser Gly Gln Glu Glu Ala Leu Arg Arg Ala Tyr Ala Arg Ala Gly Val
305                    310                    315                    320
Asp Pro Ser Thr Val Thr Leu Val Glu Gly His Gly Thr Gly Thr Pro
                325                    330                    335
Val Gly Asp Arg Ile Glu Leu Thr Ala Leu Arg Asn Val Phe Asp Ala
            340                    345                    350
Ala Asn Lys Gly Arg Lys Glu Thr Val Ala Val Gly Ser Ile Lys Ser
        355                    360                    365
Gln Ile Gly His Leu Lys Ala Val Ala Gly Phe Ala Gly Leu Val Lys
    370                    375                    380
Val Val Met Ala Leu Lys His Lys Thr Leu Pro Gln Thr Ile Asn Val
385                    390                    395                    400
His Asp Pro Pro Ala Leu His Asp Gly Ser Pro Ile Gln Asp Ser Ser
                405                    410                    415
Leu Tyr Ile Asn Thr Met Asn Arg Pro Trp Phe Thr Ala Pro Gly Val
            420                    425                    430
Pro Arg Arg Ala Gly Ile Ser Ser Phe Gly Phe Gly Gly Ala Asn Tyr
        435                    440                    445
His Ala Val Leu Glu Glu Ala Glu Pro Glu His Ala Lys Pro Tyr Arg
    450                    455                    460
Met Asn Gln Val Pro Gln Pro Val Leu Leu His Ala Ser Ser Ala Ser
465                    470                    475                    480
Ala Leu
```

<210> 14
<211> 1329
<212> DNA
<213> T. aureum

<400> 14
```
cagtcgagtg cgacgctcga atggaccctg ctccgcgagg gcgtcacgta ccgctccgcc      60
gcgatgcaca ctcctggcag tgtcgctgct ctgtttgccg ggcaaggcgc gcagtacacg     120
cacatgttcg ctgacgttgc catgaactgg ccaccgtttc gaagcgccgt gcaagagatg     180
gatgccgctc aagtcacggc ggcagcgccg aagcgcctca gcgaggtcct gtatccgcgc     240
aagccgtacg ctgcagagcc cgagcaagac aacaaggcca tctcgatgac gattaactcg     300
caaccggccc tcatggcctg cgctgctggg·gcgtttgagg tgtttcgtca agctggtctt     360
gcgcccgacc acgtcgcggg tcattctctc ggcgagtttg gtgctttgct cgccgctgga     420
tgcgcaagcc gtgaggagct cttccgtctg gtctgcagca gagcgaaggc aatgcaagac     480
gttcccaagc caagcgaggg cgtcatggca gctgtcatcg gccgtggtgc tgacaagctc     540
acgctgcaag gcgatggtgc gtggcttgcc aactgcaact cgccaagcca agtggtcatt     600
tccggcgaca agactgctgt cgagcgtgaa tccagccggt tggcaggcct tggcttcagg     660
```

```
atcattccgc ttgcatgcga aggcgccttc cattcaccgc acatgacggc ggcccaggcc      720
acgtttcagg ctgcactgga cagcctcaag atctccaccc cgacgaacgg ggcgcgcctg      780
tacaacaacg tttccggaaa gacctgccga tccctgggtg aactccgcga ctgcctgggc      840
aagcacatga caagtcctgt gctcttccag gcacaggtag agaacatgta cgctgccggg      900
gcgcgcattt tcgtggagtt tggcccgaag caagtcctct ccaagctcgt aggcgagatt      960
ctcgccgaca agtcagactt tgtgacagtc gcggtcaact cgtcatcgtc caaggacagc     1020
gacgtgcaac ttcgtgaagc tgctgcgaag ctcgcggtcc ttggcgtccc gttggcgaac     1080
tttgaccctt gggagctctg cgacgcgcgg cgtcttcgcg aatgcccgcg atccaagacg     1140
acgttgcgct tgtctgcagc gacctacgtg tcgaacaaga cccttgctgc tagggagaag     1200
gtcatggagg acaactgcga cttttcttcg ctctttgcct ccggtccagc aagccaagag     1260
atggagcgag aaatagccaa ccttcgcgct gagctggagg cggcccaacg ccagcttgac     1320
acggccaaa                                                            1329
```

<210> 15
<211> 443
<212> PRT
<213> T. aureum

<400> 15
```
Gln Ser Ser Ala Thr Leu Glu Trp Thr Leu Leu Arg Glu Gly Val Thr
1               5               10                  15
Tyr Arg Ser Ala Ala Met His Thr Pro Gly Ser Val Ala Ala Leu Phe
            20              25                  30
Ala Gly Gln Gly Ala Gln Tyr Thr His Met Phe Ala Asp Val Ala Met
            35              40                  45
Asn Trp Pro Pro Phe Arg Ser Ala Val Gln Glu Met Asp Ala Ala Gln
    50              55                  60
Val Thr Ala Ala Ala Pro Lys Arg Leu Ser Glu Val Leu Tyr Pro Arg
65                  70              75                  80
Lys Pro Tyr Ala Ala Glu Pro Glu Gln Asp Asn Lys Ala Ile Ser Met
                85              90                  95
Thr Ile Asn Ser Gln Pro Ala Leu Met Ala Cys Ala Ala Gly Ala Phe
            100             105                 110
Glu Val Phe Arg Gln Ala Gly Leu Ala Pro Asp His Val Ala Gly His
        115             120                 125
Ser Leu Gly Glu Phe Gly Ala Leu Leu Ala Ala Gly Cys Ala Ser Arg
    130             135                 140
Glu Glu Leu Phe Arg Leu Val Cys Ser Arg Ala Lys Ala Met Gln Asp
145             150                 155                 160
Val Pro Lys Pro Ser Glu Gly Val Met Ala Ala Val Ile Gly Arg Gly
                165             170                 175
Ala Asp Lys Leu Thr Leu Gln Gly Asp Gly Ala Trp Leu Ala Asn Cys
            180             185                 190
Asn Ser Pro Ser Gln Val Val Ile Ser Gly Asp Lys Thr Ala Val Glu
            195             200                 205
Arg Glu Ser Ser Arg Leu Ala Gly Leu Gly Phe Arg Ile Ile Pro Leu
    210             215                 220
Ala Cys Glu Gly Ala Phe His Ser Pro His Met Thr Ala Ala Gln Ala
225             230                 235                 240
Thr Phe Gln Ala Ala Leu Asp Ser Leu Lys Ile Ser Thr Pro Thr Asn
            245             250                 255
Gly Ala Arg Leu Tyr Asn Asn Val Ser Gly Lys Thr Cys Arg Ser Leu
            260             265                 270
Gly Glu Leu Arg Asp Cys Leu Gly Lys His Met Thr Ser Pro Val Leu
        275             280                 285
Phe Gln Ala Gln Val Glu Asn Met Tyr Ala Ala Gly Ala Arg Ile Phe
    290             295                 300
Val Glu Phe Gly Pro Lys Gln Val Leu Ser Lys Leu Val Gly Glu Ile
305             310                 315                 320
```

```
Leu Ala Asp Lys Ser Asp Phe Val Thr Val Ala Val Asn Ser Ser Ser
            325             330             335
Ser Lys Asp Ser Asp Val Gln Leu Arg Glu Ala Ala Ala Lys Leu Ala
            340             345             350
Val Leu Gly Val Pro Leu Ala Asn Phe Asp Pro Trp Glu Leu Cys Asp
            355             360             365
Ala Arg Arg Leu Arg Glu Cys Pro Arg Ser Lys Thr Thr Leu Arg Leu
        370             375             380
Ser Ala Ala Thr Tyr Val Ser Asn Lys Thr Leu Ala Ala Arg Glu Lys
385             390             395             400
Val Met Glu Asp Asn Cys Asp Phe Ser Ser Leu Phe Ala Ser Gly Pro
            405             410             415
Ala Ser Gln Glu Met Glu Arg Glu Ile Ala Asn Leu Arg Ala Glu Leu
            420             425             430
Glu Ala Ala Gln Arg Gln Leu Asp Thr Ala Lys
            435             440
```

<210> 16
<211> 267
<212> DNA
<213> T. aureum

<400> 16
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caagtcactt ccgctcccat cgccgagctc gcgcgcgccg aggccgtcgt catggaggtt      60
ctcgctgcca agactggcta cgaggtcgac atgatcgagg ccgacatgct gctcgacgcc     120
gagctcggca tcgactcggt caagcgcatt gagatcctgg cagctgtcca ggcccagctc     180
ggggtcgagg ccaaggacgt cgacgcgctc agccgcacac gaacagttgg cgaggtcgtt     240
gacgccatga aggctgagat cggcggg                                        267
```

<210> 17
<211> 89
<212> PRT
<213> T. aureum

<400> 17
```
Gln Val Thr Ser Ala Pro Ile Ala Glu Leu Ala Arg Ala Glu Ala Val
1               5               10              15
Val Met Glu Val Leu Ala Ala Lys Thr Gly Tyr Glu Val Asp Met Ile
            20              25              30
Glu Ala Asp Met Leu Leu Asp Ala Glu Leu Gly Ile Asp Ser Val Lys
        35              40              45
Arg Ile Glu Ile Leu Ala Ala Val Gln Ala Gln Leu Gly Val Glu Ala
    50              55              60
Lys Asp Val Asp Ala Leu Ser Arg Thr Arg Thr Val Gly Glu Val Val
65              70              75              80
Asp Ala Met Lys Ala Glu Ile Gly Gly
            85
```

<210> 18
<211> 2466
<212> DNA
<213> T. aureum

<400> 18
```
catctctttg gcacgggatg tgaagacctg agcctttgct ctgcttctgt ggttgagatt      60
gctcgttgca gcgaactagc tctggagcgc ccgatggatc ggcccattct tattgtaagc     120
gatggatcag cattgccggc ggctctggct agtcgactgg ggtcgtgtgc agtaatcctc     180
acgaccgcag gcgagaccga ccaatctgtg cgctcgacga agcacgttga catggaaggg     240
tggggcgagg cagatctcgt gcgcgctctt gaagcagtag agtctcgatt cggcgtccca     300
```

```
ggcggcgtcg tggtgcttga gcgcgcctca gaaacagcta gggaccagct tggctttgcc    360
ctgctgcttg ccaagcattc gagcaaagcg ctcaaccagc agatcccagg cgggcgcgcc    420
tgcttcgtgg gcgtctcgcg aatcgacgga aagctcggac ttagcggagc ttgcgcgaaa    480
ggaaagggct gggctgaggc cgcagagatt gctcagcaag gagccgtcgc gggcttgtgc    540
aagaccttgg acctagagtg gccgcacgtc ttcgctcgca gcatcgacat cgagcttggc    600
gcgaacgaag aaacagctgc gcaagcaatc tttgaggagc tctcttgccc ggacctaacg    660
gtgcgcgaag caggatacac caaagacggc aagcggtgga cgactgaggc gcgaccggtt    720
gggcttggca gcccaagcaa ggcactacgt tcttcggacg tcttcttggt ttctggtggg    780
gcgcggggaa ttacacctgt ttgcgttcgc gagttggcca aatcgatcag tggtggcact    840
tttgtcctcc tcgggcggtc ccctctcgct gatgatccgg cgtgggcttg cggcgtcgag    900
gaagcaaaca ttgggacagc cgctatggcg cacctcaagg ccgagttcgc agccgggcgc    960
ggcccgaagc cgacgccaaa ggcccacaaa gcactcgttg ggagcgtcct ggggggcgcgc   1020
gaagtccttg gttcgctaga gagtattcgc gcccagggtg cgcgcgccga gtacgtttcc   1080
tgcgacgttt cgtgtgcgga gcgcgtcaag gccgtcgtcg acgatctcga gcgacgggtc   1140
ggggctgtaa ctggggttgt gcacgcctct ggtgttctcc gagacaagtc cgttgagcgc   1200
ttggagctcg ccgacttcga ggtcgtgtac ggcaccaagg tggacggcct gctcaacctg   1260
ctgcaggccg tggaccgccc caaactccgg cacttggtcc tcttcagctc cctggccggt   1320
ttccacggca cactgggca ggccgtgtac gctatggcga atgaggcgct gaacaagatg   1380
gccttccatt ggaaactgc gatgcctggc ctctcggtca agacgatcgg gtttggacct   1440
tgggacggcg gcatggtcaa cgatgcgctg aaagcgcact ttgcgtctat gggcgtccaa   1500
attattccgc tcgacggcgg cgcggagacc gtttcccgaa tcatcggggc gtgctcgcca   1560
acacaagttc tggttggcaa ctggggcttg cccccctgtag ttcctaacgc gagcgtgcac   1620
aagattactg tgaggcttgg cggggagtct gcaaacctt tcctgtcctc gcacacgatt    1680
caaggcagaa aggtcttgcc gatgactgtg gcgcttgggc ttctcgctga ggcggctcga   1740
gggctctacg tcggtcacca agtagtcggg attgaggacg cccaagtctt ccagggagtc   1800
gtgttggaca aaggggcgac gtgtgaggtc cagcttcgcc gcgagtcttc gactgcaagc   1860
ccaagcgagg ttgtgctgag tgcttcgctc aatgtattcg cggcgggaaa ggttgtgcct   1920
gcgtaccgcg cgcatgtcgt gctcggcgct tcagggccac gcactggcgg cgtgcagctt   1980
gaactgaaag atttgggcgt ggacgccgac cctgcttgct ccgttggcaa gggtgcgctg   2040
tacgacggta ggacgctgtt ccatgggccg gcgtttcagt acatggatga ggttcttcgg   2100
tgctcgcctg cagagcttgc cgtgcggtgc cgtgtcgttc cgagcgcggc tcaggaccgc   2160
ggccaatttg tttcgcgcgg agtgttgtac gacccgttcc tgaacgacac ggtgtttcaa   2220
gctctccttg tttgggcccg tctggtcagg gacagcgctt cgctaccgag caacgttgaa   2280
cgaatctcgt tccacggcca gccgccgagc gagggcgagg tgtttacac cacgctcaag    2340
ctggacagtg ctgcgagcgg gccgctcgac ccgattgcaa aggcgcagtt cttcctccac   2400
cgagcttgcg gggcggtctt tgcatcaggg cgagcgagtg tggttctgaa caaggctctt   2460
tcgttt                                                              2466
```

<210> 19
<211> 825
<212> PRT
<213> T. aureum

<400> 19

```
Ala Ser Gly His Leu Phe Gly Thr Gly Cys Glu Asp Leu Ser Leu Cys
1               5                   10                  15
Ser Ala Ser Val Val Glu Ile Ala Arg Cys Ser Glu Leu Ala Leu Glu
            20                  25                  30
Arg Pro Met Asp Arg Pro Ile Leu Ile Val Ser Asp Gly Ser Ala Leu
        35                  40                  45
Pro Ala Ala Leu Ala Ser Arg Leu Gly Ser Cys Ala Val Ile Leu Thr
    50                  55              60
Thr Ala Gly Glu Thr Asp Gln Ser Val Arg Ser Thr Lys His Val Asp
65                  70                  75                  80
Met Glu Gly Trp Gly Glu Ala Asp Leu Val Arg Ala Leu Glu Ala Val
                85                  90                  95
Glu Ser Arg Phe Gly Val Pro Gly Gly Val Val Val Leu Glu Arg Ala
            100                 105                 110
Ser Glu Thr Ala Arg Asp Gln Leu Gly Phe Ala Leu Leu Leu Ala Lys
```

```
            115                   120                   125
His Ser Ser Lys Ala Leu Asn Gln Gln Ile Pro Gly Gly Arg Ala Cys
    130                   135                   140
Phe Val Gly Val Ser Arg Ile Asp Gly Lys Leu Gly Leu Ser Gly Ala
145                   150                   155                   160
Cys Ala Lys Gly Lys Gly Trp Ala Glu Ala Ala Glu Ile Ala Gln Gln
                  165                   170                   175
Gly Ala Val Ala Gly Leu Cys Lys Thr Leu Asp Leu Glu Trp Pro His
                  180                   185                   190
Val Phe Ala Arg Ser Ile Asp Ile Glu Leu Gly Ala Asn Glu Glu Thr
                  195                   200                   205
Ala Ala Gln Ala Ile Phe Glu Glu Leu Ser Cys Pro Asp Leu Thr Val
    210                   215                   220
Arg Glu Ala Gly Tyr Thr Lys Asp Gly Lys Arg Trp Thr Thr Glu Ala
225                   230                   235                   240
Arg Pro Val Gly Leu Gly Lys Pro Lys Gln Ala Leu Arg Ser Ser Asp
                  245                   250                   255
Val Phe Leu Val Ser Gly Gly Ala Arg Gly Ile Thr Pro Val Cys Val
                  260                   265                   270
Arg Glu Leu Ala Lys Ser Ile Ser Gly Gly Thr Phe Val Leu Leu Gly
                  275                   280                   285
Arg Ser Pro Leu Ala Asp Asp Pro Ala Trp Ala Cys Gly Val Glu Glu
    290                   295                   300
Ala Asn Ile Gly Thr Ala Ala Met Ala His Leu Lys Ala Glu Phe Ala
305                   310                   315                   320
Ala Gly Arg Gly Pro Lys Pro Thr Pro Lys Ala His Lys Ala Leu Val
                  325                   330                   335
Gly Ser Val Leu Gly Ala Arg Glu Val Leu Gly Ser Leu Glu Ser Ile
                  340                   345                   350
Arg Ala Gln Gly Ala Arg Ala Glu Tyr Val Ser Cys Asp Val Ser Cys
                  355                   360                   365
Ala Glu Arg Val Lys Ala Val Val Asp Asp Leu Glu Arg Arg Val Gly
    370                   375                   380
Ala Val Thr Gly Val Val His Ala Ser Gly Val Leu Arg Asp Lys Ser
385                   390                   395                   400
Val Glu Arg Leu Glu Leu Ala Asp Phe Glu Val Val Tyr Gly Thr Lys
                  405                   410                   415
Val Asp Gly Leu Leu Asn Leu Leu Gln Ala Val Asp Arg Pro Lys Leu
                  420                   425                   430
Arg His Leu Val Leu Phe Ser Ser Leu Ala Gly Phe His Gly Asn Thr
                  435                   440                   445
Gly Gln Ala Val Tyr Ala Met Ala Asn Glu Ala Leu Asn Lys Met Ala
    450                   455                   460
Phe His Leu Glu Thr Ala Met Pro Gly Leu Ser Val Lys Thr Ile Gly
465                   470                   475                   480
Phe Gly Pro Trp Asp Gly Gly Met Val Asn Asp Ala Leu Lys Ala His
                  485                   490                   495
Phe Ala Ser Met Gly Val Gln Ile Ile Pro Leu Asp Gly Gly Ala Glu
                  500                   505                   510
Thr Val Ser Arg Ile Ile Gly Ala Cys Ser Pro Thr Gln Val Leu Val
                  515                   520                   525
Gly Asn Trp Gly Leu Pro Pro Val Val Pro Asn Ala Ser Val His Lys
                  530                   535                   540
Ile Thr Val Arg Leu Gly Gly Glu Ser Ala Asn Pro Phe Leu Ser Ser
545                   550                   555                   560
His Thr Ile Gln Gly Arg Lys Val Leu Pro Met Thr Val Ala Leu Gly
                  565                   570                   575
Leu Leu Ala Glu Ala Ala Arg Gly Leu Tyr Val Gly His Gln Val Val
    580                   585                   590
```

```
Gly Ile Glu Asp Ala Gln Val Phe Gln Gly Val Val Leu Asp Lys Gly
        595                 600                 605
Ala Thr Cys Glu Val Gln Leu Arg Arg Glu Ser Ser Thr Ala Ser Pro
        610                 615                 620
Ser Glu Val Val Leu Ser Ala Ser Leu Asn Val Phe Ala Ala Gly Lys
625                 630                 635                 640
Val Val Pro Ala Tyr Arg Ala His Val Val Leu Gly Ala Ser Gly Pro
                645                 650                 655
Arg Thr Gly Gly Val Gln Leu Glu Leu Lys Asp Leu Gly Val Asp Ala
            660                 665                 670
Asp Pro Ala Cys Ser Val Gly Lys Gly Ala Leu Tyr Asp Gly Arg Thr
            675                 680                 685
Leu Phe His Gly Pro Ala Phe Gln Tyr Met Asp Glu Val Leu Arg Cys
        690                 695                 700
Ser Pro Ala Glu Leu Ala Val Arg Cys Arg Val Val Pro Ser Ala Ala
705                 710                 715                 720
Gln Asp Arg Gly Gln Phe Val Ser Arg Gly Val Leu Tyr Asp Pro Phe
                725                 730                 735
Leu Asn Asp Thr Val Phe Gln Ala Leu Leu Val Trp Ala Arg Leu Val
            740                 745                 750
Arg Asp Ser Ala Ser Leu Pro Ser Asn Val Glu Arg Ile Ser Phe His
            755                 760                 765
Gly Gln Pro Pro Ser Glu Gly Glu Val Phe Tyr Thr Thr Leu Lys Leu
        770                 775                 780
Asp Ser Ala Ala Ser Gly Pro Leu Asp Pro Ile Ala Lys Ala Gln Phe
785                 790                 795                 800
Phe Leu His Arg Ala Cys Gly Ala Val Phe Ala Ser Gly Arg Ala Ser
                805                 810                 815
Val Val Leu Asn Lys Ala Leu Ser Phe
            820                 825
```

```
<210> 20
<211> 1383
<212> DNA
<213> T. aureum
```

```
<400> 20
atgaaccagg gcgggagaaa tgacgagggc gtctcggtgg cgcgcgcgga cccatgccct      60
gacacgcgga tcgctgtcgt gggcatggcg gtcgagtatg caggtgccg cggcaaggaa     120
gcgttctggg acacgctcat gaacggcaaa atcaactctg cctgtatctc agacgatcgc     180
ctcgggtcag cacgacgaga agagcactat gcgcccgaga ggtcaaagta cgccgatacg     240
ttctgcaacg agaggtacgg atgcatcgat cccaaagtcg acaacgagca cgacctgctc     300
ctcggcctcg ccgcggctgc gcttcaagac gcgcaggaca ggcgcagcga cggcggcaag     360
ttcgacccag cgcagctcaa cgcgctgcggc attgtcagcg ctgcctgtc cttcccgatg     420
gacaacctgc aaggcgagct gctcaacctt taccagcccc atgctgagag cggattggc     480
aagcattgct tcgcggacca aacgccctgg tcgacgcgaa ccagagcgct tcaccgctg     540
cccggggacc cgaggaccca ccgcgaccca gcctccttcg tcgccggaca gctcggcctc     600
ggcccgctgc actactcgct cgacgccgcc tgcgcctcgg cccctttacgt tctgcgactc     660
gctcaggacc acctcctctc gggcgaggct gacttgatgc tgtgcggagc gacgtgcttc     720
ccagagcccttcttcatcct gactgggttt agcacgttcc acgcgatgcc agtcggtgag     780
aacggtgtct cgatgccgtt tcatcgggac acgcaaggc tgacgcccgg cgagggcggc     840
tcggtgatgg tgctcaagcg cctcgcggac gccgagcgcg acggagacca catctacggg     900
acgcttcttg agccagcttg agcaacgca ggctgcgggc ttcctctcaa gccgcaccag     960
ccaagcgagg aggcctgctt gaaagccacc tacgagctcg tcggcgtgcc gccccgagac    1020
gtccagtacg tcgagtgcca cgccaccggc acgccgcagg gcgacaccgt cgagctccaa    1080
gccgtcaaag cctgctttga gggcgcaagc cccggatcg ggtccacgaa aggcaacttc    1140
ggacacaccc tcgtcgcggc cggcttgcgg ggaatgtgca aggttctcct tgcaatggag    1200
cgcggcgtga tcccccgac cccgggcgtt gactctggca cccagattga tcccctcgtc    1260
gtcacagcgg cgctcccgtg gccggatacg cgcggcgggc cgaaacgcgc aggactctcc    1320
```

```
gcattcggat tcggggggcac aaacgcgcac gccgtctttg aggagcatat tccctcgaga      1380
gct                                                                    1383
```

<210> 21
<211> 461
<212> PRT
<213> T. aureum

<400> 21

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Met | Asn | Gln | Gly | Gly | Arg | Asn | Asp | Glu | Gly | Val | Ser | Val | Ala | Arg | Ala |

```
Met Asn Gln Gly Gly Arg Asn Asp Glu Gly Val Ser Val Ala Arg Ala
 1               5                  10                  15
Asp Pro Cys Pro Asp Thr Arg Ile Ala Val Val Gly Met Ala Val Glu
             20                  25                  30
Tyr Ala Gly Cys Arg Gly Lys Glu Ala Phe Trp Asp Thr Leu Met Asn
         35                  40                  45
Gly Lys Ile Asn Ser Ala Cys Ile Ser Asp Asp Arg Leu Gly Ser Ala
     50                  55                  60
Arg Arg Glu Glu His Tyr Ala Pro Glu Arg Ser Lys Tyr Ala Asp Thr
65                  70                  75                  80
Phe Cys Asn Glu Arg Tyr Gly Cys Ile Asp Pro Lys Val Asp Asn Glu
                 85                  90                  95
His Asp Leu Leu Leu Gly Leu Ala Ala Ala Ala Leu Gln Asp Ala Gln
             100                 105                 110
Asp Arg Arg Ser Asp Gly Gly Lys Phe Asp Pro Ala Gln Leu Lys Arg
             115                 120                 125
Cys Gly Ile Val Ser Gly Cys Leu Ser Phe Pro Met Asp Asn Leu Gln
     130                 135                 140
Gly Glu Leu Leu Asn Leu Tyr Gln Ala His Ala Glu Arg Arg Ile Gly
145                 150                 155                 160
Lys His Cys Phe Ala Asp Gln Thr Pro Trp Ser Thr Arg Thr Arg Ala
                 165                 170                 175
Leu His Pro Leu Pro Gly Asp Pro Arg Thr His Arg Asp Pro Ala Ser
             180                 185                 190
Phe Val Ala Gly Gln Leu Gly Leu Gly Pro Leu His Tyr Ser Leu Asp
             195                 200                 205
Ala Ala Cys Ala Ser Ala Leu Tyr Val Leu Arg Leu Ala Gln Asp His
     210                 215                 220
Leu Leu Ser Gly Glu Ala Asp Leu Met Leu Cys Gly Ala Thr Cys Phe
225                 230                 235                 240
Pro Glu Pro Phe Phe Ile Leu Thr Gly Phe Ser Thr Phe His Ala Met
                 245                 250                 255
Pro Val Gly Glu Asn Gly Val Ser Met Pro Phe His Arg Asp Thr Gln
             260                 265                 270
Gly Leu Thr Pro Gly Glu Gly Gly Ser Val Met Val Leu Lys Arg Leu
         275                 280                 285
Ala Asp Ala Glu Arg Asp Gly Asp His Ile Tyr Gly Thr Leu Leu Gly
     290                 295                 300
Ala Ser Leu Ser Asn Ala Gly Cys Gly Leu Pro Leu Lys Pro His Gln
305                 310                 315                 320
Pro Ser Glu Glu Ala Cys Leu Lys Ala Thr Tyr Glu Leu Val Gly Val
                 325                 330                 335
Pro Pro Arg Asp Val Gln Tyr Val Glu Cys His Ala Thr Gly Thr Pro
             340                 345                 350
Gln Gly Asp Thr Val Glu Leu Gln Ala Val Lys Ala Cys Phe Glu Gly
         355                 360                 365
Ala Ser Pro Arg Ile Gly Ser Thr Lys Gly Asn Phe Gly His Thr Leu
     370                 375                 380
Val Ala Ala Gly Phe Ala Gly Met Cys Lys Val Leu Leu Ala Met Glu
385                 390                 395                 400
```

```
Arg Gly Val Ile Pro Pro Thr Pro Gly Val Asp Ser Gly Thr Gln Ile
            405             410             415
Asp Pro Leu Val Val Thr Ala Ala Leu Pro Trp Pro Asp Thr Arg Gly
            420             425             430
Gly Pro Lys Arg Ala Gly Leu Ser Ala Phe Gly Phe Gly Gly Thr Asn
            435             440             445
Ala His Ala Val Phe Glu Glu His Ile Pro Ser Arg Ala
            450             455             460
```

<210> 22
<211> 1335
<212> DNA
<213> T. aureum

<400> 22
```
cagcctcgcc tcggcagcgg accaaaccga aagcttgcta tcgtcggcat ggatgccacg    60
tttggatcct tgaagggtct ctccgcacta gaagctgcgc tttacgaggc aaggcacgct   120
gcgcggcccc tgcctgcgaa gcgctggcgc ttcttggggcg gggacgagtc ctttctccac   180
gagatcggac tcgagtgctc tccgcacggg tgctacattg aggacgtgga tgtggacttt   240
aagcgactcc gcacgccaat ggtgccggag gacttgctcc ggccgcaaca gctcctggcc   300
gtgtcgacga ttgacaaggc catcctcgac tcgggcttgg ccaagggcgg caacgtggct   360
gtccttgtcg gcctcgggac ggacctcgag ctctaccgcc accgagctcg ggttgcgctt   420
aaggagcgtc ttcaaggact ggttcgctct gccgagggag gagccctgac gtctcgcctg   480
atgaactata tcaatgatag cggaacgtcg acctcctaca cgtcgtatat cggcaacctc   540
gtcgccacgc gcgtctcgtc ccagtggggc ttcactgggc cgtcgttcac cgtcacggaa   600
ggggccaact cggtccatcg gtgcgcccag ctcgccaagt acatgctcga ccgcggcgag   660
gtcgacgccg tcgtggttgc aggagtcgac ctgtgcggga cgccgaggc gttcttcgtg   720
aggtcgcgcc gcatgcagat ctcgaaaagt cagcgcccgg ccgcgccgtt tgaccgcgcc   780
gcagacggct tcttcgcggg ggaagggtgc ggcgccctcg tcttcaaacg cctgactgac   840
tgtgtgtctg gcgagcgaat ctacgcgtcc ctcgactcgg tcgtcgtcgc aaccacgccg   900
cgcgccgctc ttcgtgctgc cgcagggtcg gcgcgggttg acccagccag catcgacatg   960
gtcgagctga gcgcagattc ccaccggttt gtgcgggcgc caggcaccgt ggctcagcct  1020
ctgacagccg aagtcgaggt cggggcggtg cgggaagtga tcgggaccgc ggggagggggc  1080
tctcgaagcg tggccgtcgg atcggtccgc gccaacgtcg gggacgcagg gtttgcttcc  1140
ggggccgctg ccctcgtaaa aactgcgctc tgcttgcaca accgctactt ggcggctacc  1200
ccaggctggg atgcgcctgc tgccggcgtg gattttggtg ccgagctgta cgtttgccgc  1260
gagtcgcgtg cttgggtcaa gaacgccggc gttgcacggc acgccgcaat ttctggcgtg  1320
gacgaaggcg ggtcg                                                   1335
```

<210> 23
<211> 445
<212> PRT
<213> T. aureum

<400> 23
```
Gln Pro Arg Leu Gly Ser Gly Pro Asn Arg Lys Leu Ala Ile Val Gly
  1             5              10             15
Met Asp Ala Thr Phe Gly Ser Leu Lys Gly Leu Ser Ala Leu Glu Ala
            20             25             30
Ala Leu Tyr Glu Ala Arg His Ala Ala Arg Pro Leu Pro Ala Lys Arg
            35             40             45
Trp Arg Phe Leu Gly Gly Asp Glu Ser Phe Leu His Glu Ile Gly Leu
   50             55             60
Glu Cys Ser Pro His Gly Cys Tyr Ile Glu Asp Val Asp Val Asp Phe
 65             70             75             80
Lys Arg Leu Arg Thr Pro Met Val Pro Glu Asp Leu Leu Arg Pro Gln
            85             90             95
Gln Leu Leu Ala Val Ser Thr Ile Asp Lys Ala Ile Leu Asp Ser Gly
            100            105            110
```

```
Leu Ala Lys Gly Gly Asn Val Ala Val Leu Val Gly Leu Gly Thr Asp
        115             120             125
Leu Glu Leu Tyr Arg His Arg Ala Arg Val Ala Leu Lys Glu Arg Leu
    130             135             140
Gln Gly Leu Val Arg Ser Ala Glu Gly Gly Ala Leu Thr Ser Arg Leu
145             150             155             160
Met Asn Tyr Ile Asn Asp Ser Gly Thr Ser Thr Ser Tyr Thr Ser Tyr
            165             170             175
Ile Gly Asn Leu Val Ala Thr Arg Val Ser Ser Gln Trp Gly Phe Thr
        180             185             190
Gly Pro Ser Phe Thr Val Thr Glu Gly Ala Asn Ser Val His Arg Cys
        195             200             205
Ala Gln Leu Ala Lys Tyr Met Leu Asp Arg Gly Glu Val Asp Ala Val
    210             215             220
Val Val Ala Gly Val Asp Leu Cys Gly Ser Ala Glu Ala Phe Phe Val
225             230             235             240
Arg Ser Arg Arg Met Gln Ile Ser Lys Ser Gln Arg Pro Ala Ala Pro
            245             250             255
Phe Asp Arg Ala Ala Asp Gly Phe Phe Ala Gly Glu Gly Cys Gly Ala
        260             265             270
Leu Val Phe Lys Arg Leu Thr Asp Cys Val Ser Gly Glu Arg Ile Tyr
        275             280             285
Ala Ser Leu Asp Ser Val Val Val Ala Thr Thr Pro Arg Ala Ala Leu
    290             295             300
Arg Ala Ala Ala Gly Ser Ala Arg Val Asp Pro Ala Ser Ile Asp Met
305             310             315             320
Val Glu Leu Ser Ala Asp Ser His Arg Phe Val Arg Ala Pro Gly Thr
            325             330             335
Val Ala Gln Pro Leu Thr Ala Glu Val Glu Val Gly Ala Val Arg Glu
            340             345             350
Val Ile Gly Thr Ala Gly Arg Gly Ser Arg Ser Val Ala Val Gly Ser
            355             360             365
Val Arg Ala Asn Val Gly Asp Ala Gly Phe Ala Ser Gly Ala Ala Ala
    370             375             380
Leu Val Lys Thr Ala Leu Cys Leu His Asn Arg Tyr Leu Ala Ala Thr
385             390             395             400
Pro Gly Trp Asp Ala Pro Ala Ala Gly Val Asp Phe Gly Ala Glu Leu
            405             410             415
Tyr Val Cys Arg Glu Ser Arg Ala Trp Val Lys Asn Ala Gly Val Ala
            420             425             430
Arg His Ala Ala Ile Ser Gly Val Asp Glu Gly Gly Ser
            435             440             445
```

```
<210> 24
<211> 1488
<212> DNA
<213> T. aureum

<400> 24
tgctatgggc tggttctttc ggacgtgcct gggcagtacg agaccggcaa ccgcatctcc    60
ctccaggccg agtcgcccaa gctcttgctc ctctcggctc cagaccacgc cgccttgctg   120
gacaaggtgg cggccgagct cgcagccctt gagcaagccg acggcttgag cgccgccgcg   180
gctgccgtag accgcttact cggcgagtcg ctcgtcggtt gcgcggctgg cagcggcggg   240
ctgacccttt gcttggtggc ttcgcctgcc agcctccaca aggagcttgc gctggcccat   300
cgagggatcc cgcgctgcat caaagcacgg cgcgactggg ccagcccggc agggagctac   360
ttcgccccgg agccgatcgc aagcgaccgc gtcgcgttca tgtacgggga aggacgaagc   420
ccgtactgcg cgtcggccg cgacctccac cggatctggc ccgcgctgca tgagcgggtg   480
aacgccaaga ctgtcaacct ctggggtgac ggtgacgcct ggctgctgcc acgtgcaacc   540
tcggccgagg aagaggagca actctgccgc aacttcgact cgaaccaggt tgagatgttt   600
```

```
cgaacgggcg tgtacatctc gatgtgcttg accgacctcg ctcgaagctt gattggactg    660
ggccctaagg cgagctttgg gctcagccta ggcgaggttt ccatgctctt cgctctgagc    720
gagtccaact gtagactgtc ggaggaaatg acccgcaggc tccgtgcgtc cccggtgtgg    780
aactcggagc tcgccgtcga gttcaacgcc cttcgaaagt tgtggggggt cgcgccgggg    840
gcaccgtcg actcgttctg caaggttat gtcgtgcgcg caacgcgggc tcaggtggag    900
caagccattg gggaggacaa tcagtttgtg cgtctcctga tcgtgaacga ctcgcaatca    960
gtcctgatcg ccggcaagcc ggcggcgtgc gaagccgtaa ttgctcgcat cgggtctatt   1020
cttcccccgc tgcaagtgtc gcaaggcatg gtggggcact gtgccgaggt cttgccgtac   1080
acgagcgaga tcgggcgcat ccacaacatg cttcgcttcc atcgcagga cgaaacgggc   1140
ggttgcaaaa tgtactctag cgtctcaaac tcgcgcatcg ggccagtcga ggagagccag   1200
atgggcccag gcactgagct cgttttctcg ccgtcaatgg aagactttgt cgcccagctg   1260
tactcgcgag ttgcagactt tccggcgatc accgaggcgg tttaccagca gggtcatgac   1320
gtgtttgtcg aagtggggcc ggaccattca cggtcggctg ctgtccgctc cacgcttgga   1380
cccactcggc gacacatcgc tgtggcgatg gaccgcaagg gtgagtcagc ttggtcgcag   1440
cttctgaaaa tgctggctac gcttgcgtcg caccgcgtgc cgggcctg              1488
```

```
<210> 25
<211> 496
<212> PRT
<213> T. aureum
```

```
<400> 25
Cys Tyr Gly Leu Val Leu Ser Asp Val Pro Gly Gln Tyr Glu Thr Gly
1               5                   10                  15
Asn Arg Ile Ser Leu Gln Ala Glu Ser Pro Lys Leu Leu Leu Leu Ser
            20                  25                  30
Ala Pro Asp His Ala Ala Leu Leu Asp Lys Val Ala Ala Glu Leu Ala
        35                  40                  45
Ala Leu Glu Gln Ala Asp Gly Leu Ser Ala Ala Ala Ala Ala Val Asp
    50                  55                  60
Arg Leu Leu Gly Glu Ser Leu Val Gly Cys Ala Ala Gly Ser Gly Gly
65                  70                  75                  80
Leu Thr Leu Cys Leu Val Ala Ser Pro Ala Ser Leu His Lys Glu Leu
                85                  90                  95
Ala Leu Ala His Arg Gly Ile Pro Arg Cys Ile Lys Ala Arg Arg Asp
            100                 105                 110
Trp Ala Ser Pro Ala Gly Ser Tyr Phe Ala Pro Glu Pro Ile Ala Ser
        115                 120                 125
Asp Arg Val Ala Phe Met Tyr Gly Glu Gly Arg Ser Pro Tyr Cys Gly
    130                 135                 140
Val Gly Arg Asp Leu His Arg Ile Trp Pro Ala Leu His Glu Arg Val
145                 150                 155                 160
Asn Ala Lys Thr Val Asn Leu Trp Gly Asp Gly Asp Ala Trp Leu Leu
                165                 170                 175
Pro Arg Ala Thr Ser Ala Glu Glu Glu Gln Leu Cys Arg Asn Phe
            180                 185                 190
Asp Ser Asn Gln Val Glu Met Phe Arg Thr Gly Val Tyr Ile Ser Met
            195                 200                 205
Cys Leu Thr Asp Leu Ala Arg Ser Leu Ile Gly Leu Gly Pro Lys Ala
    210                 215                 220
Ser Phe Gly Leu Ser Leu Gly Glu Val Ser Met Leu Phe Ala Leu Ser
225                 230                 235                 240
Glu Ser Asn Cys Arg Leu Ser Glu Glu Met Thr Arg Arg Leu Arg Ala
                245                 250                 255
Ser Pro Val Trp Asn Ser Glu Leu Ala Val Glu Phe Asn Ala Leu Arg
            260                 265                 270
Lys Leu Trp Gly Val Ala Pro Gly Ala Pro Val Asp Ser Phe Trp Gln
        275                 280                 285
Gly Tyr Val Val Arg Ala Thr Arg Ala Gln Val Glu Gln Ala Ile Gly
```

```
            290                      295                      300
Glu Asp Asn Gln Phe Val Arg Leu Leu Ile Val Asn Asp Ser Gln Ser
305                      310                      315                      320
Val Leu Ile Ala Gly Lys Pro Ala Ala Cys Glu Ala Val Ile Ala Arg
                325                      330                      335
Ile Gly Ser Ile Leu Pro Pro Leu Gln Val Ser Gln Gly Met Val Gly
                340                      345                      350
His Cys Ala Glu Val Leu Pro Tyr Thr Ser Glu Ile Gly Arg Ile His
            355                      360                      365
Asn Met Leu Arg Phe Pro Ser Gln Asp Glu Thr Gly Gly Cys Lys Met
            370                      375                      380
Tyr Ser Ser Val Ser Asn Ser Arg Ile Gly Pro Val Glu Glu Ser Gln
385                      390                      395                      400
Met Gly Pro Gly Thr Glu Leu Val Phe Ser Pro Ser Met Glu Asp Phe
                405                      410                      415
Val Ala Gln Leu Tyr Ser Arg Val Ala Asp Phe Pro Ala Ile Thr Glu
                420                      425                      430
Ala Val Tyr Gln Gln Gly His Asp Val Phe Val Glu Val Gly Pro Asp
                435                      440                      445
His Ser Arg Ser Ala Ala Val Arg Ser Thr Leu Gly Pro Thr Arg Arg
            450                      455                      460
His Ile Ala Val Ala Met Asp Arg Lys Gly Glu Ser Ala Trp Ser Gln
465                      470                      475                      480
Leu Leu Lys Met Leu Ala Thr Leu Ala Ser His Arg Val Pro Gly Leu
                485                      490                      495
```

<210> 26
<211> 1683
<212> DNA
<213> T. aureum

<400> 26
```
gcgaccatcc ctgaggccgt cgcaacaatt ctgccggcaa ctgctgcgat ttcgcctcca    60
aagcttggcg ctccgcacga ctcgcaaccc gaggcggagg ctcgccccgt gggcgaggcc   120
tctgtgccaa ggcgggccac gagctcgagc aaattggcca ggacgcttgc catcgatgct   180
tgcgactccg acgtgcgcgc cgccttgctg gacctggacg cgccaatcgc ggtcggcggc   240
tcctcgcgcg cccaagtccc gccgtgccca gtgagcgcgc tcggaagcgc cgcctttcga   300
gcggcacacg gcgtcgatta tgcgctctac atgggcgcaa tggccaaagg cgtcgcgtca   360
gcggagatgg tcatcgctgc tggcaaggcc cgcatgctcg cgtcatttgg cgcggggggg   420
cttcccctgg gcgaggtcga agaggcgttg gacaagatcc aggccgctct gcccgagggg   480
ccgttcgccg tcaacctcat tcactcgccg ttcgatccaa accttgagga gggcaacgtc   540
gagctgttcc tgaggcgcgg tatccggctg gtcgaggcct ctgcgttcat gtcggtcacg   600
ccgtcgttgg tgcgctaccg agtcgccgga ctcgagcgag ccctggcgg gaccgcccga    660
gtgctgaacc gcgtgattgg caaggtgagc cgtgcggagc tcgcagaaat gtttatgcgg   720
ccgcctcccg ccgcgatcgt ctccaagctc ctcgcccagg gcctggtcac tgaggagcag   780
gcgtcacttg cagagatcgt cccactggtt gacgacgttg caatcgaagc cgactcgggc   840
ggtcacacag acaaccgccc gatccacgtc gttttgcccg tcgtcctcgc gctgcgagac   900
cgcgtcatgc gtgagtgcaa gtatccagcc gccaatcgcg tccgcgtggg cgccggaggc   960
gggatcggct gccctgccgc ggcgcgagct gcgttcgaca tgggcgcagc attcgttctc  1020
acgggctcga tcaaccagct cacgcgccag gctgggacga cgacagcgt gcgtgctgcc   1080
cttgcacgcg cgacctactc ggacgtgaca atggccccgg cggccgatat gtttgaccag  1140
ggcgtcaagc tgcaggtctt gaagcgcggc acgatgttcc cggcgcgcgc aaacaagctg  1200
tacgagttgt tcaccactta ccagtcgctg gacgcgatcc ctcgggctga gctggctcgc  1260
ctggaaaagc gagttttccg catgtccatc gacgaggttt ggaacgaaac caagcagttc  1320
tacgagaccc ggctcaacaa ccccgccaag gttgcccggg cggagcgcga ccccaagctc  1380
aagatgtcgc tctgctttcg gtggtacttg tcgaaaagct ccaagtgggc atcgactgga  1440
caagttgggc gcgagctgga ctaccaggtc tggtgcggcc ccacgattgg cgctttcaac  1500
gagttcgtga aggggtccag cctcgacgcg gaggcttgcg ggggcggtt tccttgcgtt   1560
gtgcgcgtta accaggagat attatgtggc gctgcttacg agcagcgact ggcgcgtttc  1620
```

```
atgctgctcg ctggccggga aagcgcggac gcgttggcgt acacggttgc ggaagccaga      1680
tag                                                                     1683
```

<210> 27
<211> 560
<212> PRT
<213> T. aureum

<400> 27

```
Ala Thr Ile Pro Glu Ala Val Ala Thr Ile Leu Pro Ala Thr Ala Ala
 1               5                  10                  15
Ile Ser Pro Pro Lys Leu Gly Ala Pro His Asp Ser Gln Pro Glu Ala
            20                  25                  30
Glu Ala Arg Pro Val Gly Glu Ala Ser Val Pro Arg Arg Ala Thr Ser
        35                  40                  45
Ser Ser Lys Leu Ala Arg Thr Leu Ala Ile Asp Ala Cys Asp Ser Asp
    50                  55                  60
Val Arg Ala Ala Leu Leu Asp Leu Asp Ala Pro Ile Ala Val Gly Gly
65                  70                  75                  80
Ser Ser Arg Ala Gln Val Pro Pro Cys Pro Val Ser Ala Leu Gly Ser
                85                  90                  95
Ala Ala Phe Arg Ala Ala His Gly Val Asp Tyr Ala Leu Tyr Met Gly
            100                 105                 110
Ala Met Ala Lys Gly Val Ala Ser Ala Glu Met Val Ile Ala Ala Gly
        115                 120                 125
Lys Ala Arg Met Leu Ala Ser Phe Gly Ala Gly Gly Leu Pro Leu Gly
    130                 135                 140
Glu Val Glu Glu Ala Leu Asp Lys Ile Gln Ala Ala Leu Pro Glu Gly
145                 150                 155                 160
Pro Phe Ala Val Asn Leu Ile His Ser Pro Phe Asp Pro Asn Leu Glu
                165                 170                 175
Glu Gly Asn Val Glu Leu Phe Leu Arg Arg Gly Ile Arg Leu Val Glu
            180                 185                 190
Ala Ser Ala Phe Met Ser Val Thr Pro Ser Leu Val Arg Tyr Arg Val
        195                 200                 205
Ala Gly Leu Glu Arg Gly Pro Gly Gly Thr Ala Arg Val Leu Asn Arg
    210                 215                 220
Val Ile Gly Lys Val Ser Arg Ala Glu Leu Ala Glu Met Phe Met Arg
225                 230                 235                 240
Pro Pro Pro Ala Ala Ile Val Ser Lys Leu Leu Ala Gln Gly Leu Val
                245                 250                 255
Thr Glu Glu Gln Ala Ser Leu Ala Glu Ile Val Pro Leu Val Asp Asp
            260                 265                 270
Val Ala Ile Glu Ala Asp Ser Gly Gly His Thr Asp Asn Arg Pro Ile
        275                 280                 285
His Val Val Leu Pro Val Val Leu Ala Leu Arg Asp Arg Val Met Arg
    290                 295                 300
Glu Cys Lys Tyr Pro Ala Ala Asn Arg Val Arg Val Gly Ala Gly Gly
305                 310                 315                 320
Gly Ile Gly Cys Pro Ala Ala Ala Arg Ala Ala Phe Asp Met Gly Ala
                325                 330                 335
Ala Phe Val Leu Thr Gly Ser Ile Asn Gln Leu Thr Arg Gln Ala Gly
            340                 345                 350
Thr Ser Asp Ser Val Arg Ala Ala Leu Ala Arg Ala Thr Tyr Ser Asp
        355                 360                 365
Val Thr Met Ala Pro Ala Ala Asp Met Phe Asp Gln Gly Val Lys Leu
    370                 375                 380
Gln Val Leu Lys Arg Gly Thr Met Phe Pro Ala Arg Ala Asn Lys Leu
385                 390                 395                 400
```

```
Tyr Glu Leu Phe Thr Thr Tyr Gln Ser Leu Asp Ala Ile Pro Arg Ala
            405             410                 415
Glu Leu Ala Arg Leu Glu Lys Arg Val Phe Arg Met Ser Ile Asp Glu
            420             425                 430
Val Trp Asn Glu Thr Lys Gln Phe Tyr Glu Thr Arg Leu Asn Asn Pro
            435             440                 445
Ala Lys Val Ala Arg Ala Glu Arg Asp Pro Lys Leu Lys Met Ser Leu
        450             455             460
Cys Phe Arg Trp Tyr Leu Ser Lys Ser Ser Lys Trp Ala Ser Thr Gly
465                 470             475                     480
Gln Val Gly Arg Glu Leu Asp Tyr Gln Val Trp Cys Gly Pro Thr Ile
                485             490                 495
Gly Ala Phe Asn Glu Phe Val Lys Gly Ser Ser Leu Asp Ala Glu Ala
            500             505                 510
Cys Gly Gly Arg Phe Pro Cys Val Val Arg Val Asn Gln Glu Ile Leu
            515             520                 525
Cys Gly Ala Ala Tyr Glu Gln Arg Leu Ala Arg Phe Met Leu Leu Ala
            530             535                 540
Gly Arg Glu Ser Ala Asp Ala Leu Ala Tyr Thr Val Ala Glu Ala Arg
545                 550                 555                     560
```